



The **topics** and **types of questions** examined in this Achievement Standard. Use this sheet to plan and organise your study so that you cover everything that is required.

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## 1.7 NUMBERS

AS 90151

Solve straightforward number problems in context

### 1.7 1. Solve straightforward number problems in context A

- integers
- fractions, decimals and percentages
- percentage increase or decrease (e.g. mark-up, discount, GST)
- expressing one quantity as a percentage of another
- sharing quantities in a given ratio

► Kim and Robert want to buy a CD player.

- (a) A shop has a CD player for \$109.99 plus GST (at 12.5%).

How much would Kim and Robert have to pay for this CD player?

- (b) Another shop has a CD player advertised as 'Was \$135.95 Now \$119.95'. What has been the percentage reduction in price?

- (c) A third shop has a CD player costing \$144.95. This shop is having a '20% off' sale. Kim wants to work out, in her head, an estimate of the discount she would get.

Write down the calculation she needs to do to give an estimate of the discount. Do not calculate the answer.

- (d) Kim and Robert decide to buy a CD player costing \$140.00. They decide to share the cost in the ratio of Kim : Robert = 4:3

Work out how much each of them have to pay.

- (a) At the Olympic Games in Barcelona,  $\frac{1}{2}$  the medals won by New Zealand were bronze medals and  $\frac{2}{5}$  were silver medals. The rest were gold medals.

What fraction of the medals won by New Zealand at Barcelona were gold medals?

- (b) There were 364 athletes in the New Zealand Olympic Team that went to Barcelona in 1992. The number of athletes increased by 15.2% for the next Olympic Games in Atlanta in 1996.

How many athletes were in the New Zealand Olympic Team that went to Atlanta?

### 1.7 2. Solve number problems in context M

- finding the original quantity given a percentage change
- finding the GST exclusive price from the GST inclusive price
- manipulating numbers expressed in standard form
- solving multi-step problems

- (a) The earth is  $1.496 \times 10^8$  km from the sun. This distance is called one astronomical unit (AU). Pluto is  $5.913 \times 10^9$  km from the earth. How many astronomical units is this? Give your answer in standard form.

- (b) Pluto has a radius of 2274 km at its equator. This is 17.83% of the radius of the earth at its equator.

What is the radius of the earth at its equator?

- (c) Robert wants to buy a telescope. He has \$300 in his bank account. The shop has a telescope for sale at \$345 GST inclusive. The shop has a 'We will pay the GST' sale. GST is 12.5%.

Does Robert have enough money in his bank account to buy the telescope? You must justify your answer with calculations.

- The table shows student roll numbers for this year at Seaview College.

	Year 9	Year 10	Year 11	Year 12	Year 13	Total
Roll	240	280	310	230	125	1185

In 2006, at Seaview College, the Years 9 and 10 roll is expected to increase by  $\frac{1}{4}$ . The Years 11 and 12 roll is expected to drop by 10%. Fifteen fewer students are expected in Year 13.

Calculate the percentage change in the total roll at Seaview College from 2005 to 2006.

### 1.7 3. Devise a strategy and solve a number problem E

- problems involving situations that require a number of sequential calculations
- the strategy used and the problem-solving process should be clearly and logically communicated

- The ninety students in Happy Valley High School's representative sports teams are organising a Sports Awards Barbeque for 250 people.

The food they need to buy is sausages, bread and tomato sauce.

The school's Board of Trustees will pay 15% of the cost of the food.

The Parents' Association will pay  $\frac{1}{4}$  of the cost of the food.

The ninety students will share the balance of the cost of the food.

One kilogram of sausages will feed six people.

Sausages are \$5 per kg, and the butcher will give the students a 10% discount.

One loaf of bread will feed 10 people. Bread costs \$2.50 per loaf.

One bottle of tomato sauce will be enough for 15 people, and costs \$2.80 per bottle.

Calculate how much each student will have to pay to just cover the cost of the food.

You must explain how you calculate your answer.

- Kim's father wants to borrow some money from Kim. He agrees to pay her back the money, plus 25% interest, in three years' time.

Her father will pay back \$3800 at the end of three years.

Her mother also borrowed money from Kim for three years.

She offers to pay 8.2% interest on the money each year.

This interest would be added to the amount owed at the end of each year. This total would be the new amount on which the interest would be calculated for the next year.

Her mother would then pay the money she owed at the end of three years. She will also pay back \$3800 at the end of three years.

What is the total amount that Kim lent to her parents? Show all your working. State what you are doing at each step.